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EXAMINER

JOLLEY, KIRSTEN

ART UNIT

PAPER NUMBER

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/034,893

Applicant(s)

SCHADE ET AL.

Examiner

Kirsten Crockford Jolley

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-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 March 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 33-52 is/are pending in the application.
- 4a) Of the above claim(s) 51 and 52 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 33-50 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2,3.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election without traverse of Group III, claims 33-40, in Paper No. 5 is acknowledged. The Examiner notes that Applicant canceled claims 1-32, Groups I and II, directed to a recording medium product and a coating composition respectively.
2. Newly submitted claims 51-52 are directed to an invention that is independent or distinct from the invention originally claimed and elected for the following reasons: Claims 51 and 52 are directed to a recording medium product (similar to original Group I), and the product as claimed can be made by another and materially different process (MPEP 806.05(f)), such as by forming a porous film containing polyvinyl alcohol and boric acid and laminating the porous film onto an absorbent paper substrate.

Since applicant has received an action on the merits for the originally presented and elected invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 51-52 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

Information Disclosure Statement

3. In the Information Disclosure Statement filed April 1, 2002, the two Japanese references were originally listed by their Application number and application date. The references should be listed on the PTO-1449 by their *Publication* number and publication date, therefore it is noted

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that the Examiner changed the document number and date of the Japanese documents on the attached PTO-1449 form.

Specification

4. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. Due to the restriction requirement, the claims are no longer directed to an ink jet recording media product.

The following title is suggested: Method of Making an Ink Jet Recording Media.

5. The disclosure is objected to because of the following informalities:

In the last paragraph on page 7 of the specification, it is not clear whether the percentages and parts of the materials listed are determined by weight or by volume.

Co-pending application Serial No. 09/838,480 is referred to on page 15 of the specification. The specification should be amended to indicate that the co-pending application is "commonly owned." If the application is not commonly owned, then it may not be referred to in the specification.

On page 3 of the specification, the use of footnotes in the specification is not proper because it is confusing for the printer during publication of the specification. The Examiner suggests that the information provided in the footnote is incorporated into the body of the specification.

Appropriate correction is required.

6. The use of the trademarks have been noted in this application, for example "Elvanol," "Airvol," and "Berset" on pages 11, 16, and 17 of the specification. Trademarks should be

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capitalized wherever they appear and be accompanied by the generic terminology. Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner which might adversely affect their validity as trademarks.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8. Claims 35-37 and 46 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

In claim 35, line 2, the phrase “*at least* 30 pounds per 3,000 square feet [emphasis added]” appears to be new matter. The specification discloses using paper having a basis weight of 30-150 pounds per 3000 square feet at page 7, line 2, of “as low as 30 pounds” and 30-60 pounds in page 7, second full paragraph. However, the claimed range of “at least 30” is inclusive of from 30 up to infinity. Therefore, the claimed weight range is broader than the ranges disclosed in the specification and appears to contain new matter. Claim 36 is rejected because it depends from claim 35 and does not correct the deficiencies of claim 35.

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In claim 37, line 3, the phrase “about 80 to about 100 pounds per 3000 square feet [emphasis added]” appears to be new matter. The specification discloses using a high gloss supercalendered paper having a basis weight of 90-100 pounds at page 7, first full paragraph. However, the specification does not appear to disclose high gloss supercalendered paper of about 80 to about 100 pounds per 3000 square feet.

Claim 46 appears to contain new matter because the ranges required -- makedown water comprises from about 75 to about 85 percent by weight, boric acid comprises from about 0.5 to about 1.0 percent by weight, and polyvinyl alcohol comprises from about 15 to about 24 percent by weight of the composition -- are not disclosed in the specification. See the last paragraph on page 12 of the specification, continuing to page 13. The ranges claimed are subsets of the ranges disclosed in the specification, and the endpoints are not given as examples in the specification, therefore the claimed ranges are new matter.

If Applicants can locate disclosure of these limitations in the specification, then they should so state on the record and the Examiner will withdraw the rejections.

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 39-40 and 49 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 39 and 40 are vague and indefinite because it is not clear whether the percentages and parts of the listed materials are determined by weight or by volume, and one skilled in the art

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would not be able to determine whether they are infringing Applicant's claims. Additionally, the specification does not appear to define the method of measure used.

Examiner's Suggestions

11. In claims 37 and 40, line 2 of each, in the phrase "in the order of," the Examiner suggests replacing "in" with --on-- because "in the order of" is an awkward phrase.

12. It is noted that claim 43 further limits "said ink setting agent" of claim 42, however an ink setting agent is not introduced in claim 42. Claim 43 has been interpreted for purposes of examination as requiring an ink setting agent in the coating comprising a cationic or conductive polymer. The Examiner suggests either introducing an ink setting agent in claim 42, or clarifying in claim 43 that an ink setting agent is added to the coating composition of claim 42, in order to clarify claim 43.

13. In claim 50, line 6, the comma between "alcohol" and "bonds" appears to be a typographical error. The Examiner suggests deleting the comma so that the claim reads more clearly.

Claim Rejections - 35 USC § 102

14. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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15. Claim 50 is rejected under 35 U.S.C. 102(e) as being anticipated by Saito et al.

In Example 1 of Saito et al. (column 12), Saito et al. teaches the steps of: providing coating composition makedown water; adding boric acid and polyvinyl alcohol to the water; reacting the boric acid and polyvinyl alcohol; and applying the composition to an absorbent paper substrate. While Saito et al.'s paper substrate is overcoated with polyethylene layers, thus forming a non-absorbent support, the method of Saito et al. none-the-less reads on Applicant's claimed limitation of "applying the composition to an absorbent paper substrate." Because claim 33 includes broad "comprising" language, the claim does not exclude the presence of additional steps such as Saito et al.'s step of applying polyethylene layers onto the absorbent paper substrate prior to applying the coating composition. The transitional term "comprising," which is synonymous with "including," "containing," or "characterized by," is inclusive or open-ended and does not exclude additional, unrecited elements or method steps. *Moleculon Research Corp. v. CBS, Inc.*, 793 F.2d 1261, 229 USPQ 805 (Fed. Cir. 1986); *In re Baxter*, 656 F.2d 679, 686, 210 USPQ 795, 803 (CCPA 1981); *Ex parte Davis*, 80 USPQ 448, 450 (Bd. App. 948) ("comprising" leaves "the claim open for the inclusion of unspecified ingredients even in major amounts").

Additionally, while Saito et al. does not specifically teach that PVOH-boric acid-PVOH bonds are formed, it is the Examiner's position that PVOH-boric acid-PVOH bonds would inherently be formed in Saito et al.'s coated product. Page 4 of Applicant's own specification discloses that, when PVOH and boric acid are cooked together in an aqueous solution, PVOH-boric acid-PVOH bonds are formed. Since Saito et al. teaches heating its coating composition comprising both PVOH and boric acid at 40°C before application onto the substrate, it is the

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Examiner's position that PVOH-boric acid-PVOH bonds would necessarily be similarly formed in Saito et al.'s coating composition as a result of its heating/cooking step.

Claim Rejections - 35 USC § 103

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

17. Claims 33, 35-38, 41, and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito et al. (US 6,217,166).

With respect to independent claim 50, Saito et al. is applied for two separate teachings -- its Background section which discloses that ink jet recording sheets having a water absorptive substrate are known in the art, and its invention which discloses a novel void-type ink-absorbing layer applied on a non-absorptive substrate. Saito et al. discloses in its Background that while ink jet recording sheets using an absorptive substrate are known, they are disadvantageous because after ink jet recording the support becomes wavy, wrinkling occurs on the images or a part of the dyes penetrates into the support which lowers the density. In Saito et al.'s invention, Saito et al. discloses an improved ink absorbing layer that comprises a hydrophilic binder (polyvinyl alcohol) and fine inorganic particles which when interacted with the polyvinyl alcohol forms void formations. The ink absorbing layer of Saito et al. results in high ink absorptivity and little deterioration after printing.

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It is the Examiner's position that one having ordinary skill in the art, upon collectively reviewing both the prior art of Saito et al. and its disadvantages, and the ink absorbing layer of Saito et al.'s invention which itself holds enough ink to make an image and also allows ink to be absorbed in a defined pattern, would have been motivated to combine the two teachings and prepare an ink recording sheet comprised of an absorptive substrate combined with the ink absorbing layer of Saito et al.'s invention because one would desire an ink absorbing layer on an absorptive substrate in order to absorb enough ink that the ink will not penetrate through to the absorptive substrate underneath and thereby preventing or minimizing the known drawbacks of absorptive substrates such as lowered density, wrinkling, and waviness. The test of obviousness is not express suggestion of the claimed invention in any or all references but rather what the references taken collectively would suggest to those of ordinary skill in the art presumed to be familiar with them. *In re Rosselet*, 347 F.2d 847, 146 USPQ 183 (CCPA 1965); *In re Hedges*, 783 F.2d 1038. It would have been obvious to one having ordinary skill in the art to have modified the Background teaching of Saito et al. of using an absorptive substrate in an ink jet recording sheet in combination with Saito et al.'s inventive ink absorbing layer for the reasons discussed and with the expectation of successful results because Saito et al.'s ink absorbing layer would have the same characteristics no matter the substrate since it does not interact with the substrate.

The method of forming the ink absorbing layer of Saito et al. comprises the steps of: providing coating composition makedown water; adding boric acid and polyvinyl alcohol (PVOH) to the water thus forming a coating composition; heating the composition to 40°C; and applying a coating of the composition onto the substrate (see Example 1 in column 12). Saito et

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al. lacks a teaching that PVOH-boric acid-PVOH bonds are formed when the boric acid and PVOH are reacted together. It is the Examiner's position that PVOH-boric acid-PVOH bonds would inherently be formed in Saito et al.'s coated product. Page 4 of Applicant's own specification discloses that, when PVOH and boric acid are cooked together in an aqueous solution, PVOH-boric acid-PVOH bonds are formed. Since Saito et al. teaches heating its coating composition comprising both PVOH and boric acid at 40°C before application onto the substrate, it is the Examiner's position that PVOH-boric acid-PVOH bonds would necessarily be similarly formed in Saito et al.'s coating composition as a result of its heating step.

With respect to independent claim 33, Saito et al. is applied for the same reasons discussed above. Saito et al. lacks a teaching of preheating the makedown water, the claimed order of the addition of boric acid and PVOH to the preheated makedown water, and that the coating forms a three-dimensional porous screen or sieve. Saito et al. teaches that the polyvinyl alcohol is first added to the makedown water, followed by adding boric acid, followed by heating the composition. It is the Examiner's position that it would have been obvious for an artisan skilled in the art to have reversed the order of addition of the two chemicals to the makedown water, and to have preheated the water and added the chemicals to the preheated water instead of heating the composition as a whole after addition of the chemicals because one skilled in the art would expect similar results regardless of the order that the steps occur, in the absence of a showing of criticality of the sequence of the steps, because no matter which sequence of steps is used the end result would be the same - i.e., a heated solution containing reacted PVOH and boric acid, and it is noted that the heating of a composition of PVOH and boric acid is what is necessary to form the PVOH-boric acid-PVOH bonds according to the specification. In general,

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the transposition of process steps, where the processes are substantially identical or equivalent in terms of function, manner and result, was held to not patentably distinguish the processes. *Ex parte Rubin*, 128 USPQ 440 (Bd. Pat. App. 1959).

Additionally, Saito et al. teaches in Example 1 that a high-speed homogenizer is used stir the composition during the addition of silica particles and cationic mordant, however it is unclear whether the high-speed homogenizer is also used to stir the composition once the polyvinyl alcohol and boric acid are added. Regardless, it is the Examiner's position that it would have been obvious to one having ordinary skill in the art to have mixed the coating solution until both the boric acid and polyvinyl alcohol are completely dissolved because, in order for the entire amounts of boric acid and polyvinyl alcohol to react with one another completely (which is necessary to achieve the proper ratio of boric acid to polyvinyl alcohol which is taught by Saito et al. in columns 5-6), they must be completely dissolved in solution and not exist as particulates because particulates or clumps of material have an amount that is unreacted in the middle of the clump.

As to the formation of a three-dimensional porous screen or sieve, it is the Examiner's position that a three-dimensional porous screen or sieve is inherently formed in the process of Saito et al. because, as stated above, both Applicant's and Saito et al.'s processes comprise cooking a composition comprising PVOH and boric acid, and therefore one would expect the similar results for both processes. Additionally, it is noted that Saito et al. teaches a void-type coating is formed, having internal voids, which is similar to a screen or sieve.

Paper substrates are well known in the art to be water-absorptive substrates used in ink jet recording sheets. It would have been obvious for one having ordinary skill in the art to have

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used Saito et al.'s paper support without the polyethylene layer as the absorptive support in the modified process discussed above, because the polyethylene layer in Saito et al.'s inventive process is what turns the absorptive paper substrate into a non-absorptive substrate and because it is known that papers having weights taught by Saito et al. are successful in the invention.

As to claim 35, Saito et al. teaches that the basis weight of the paper in the substrate is preferably 50-200 g/m², or ~30.7-123 lb/3000 ft² (col. 10, lines 20-21), which range falls within Applicant's claimed range.

As to claim 36, Saito et al. lacks a teaching of the coat weight at which its coating composition is applied. One skilled in the art would have recognized that coat weight is a result-effective variable because if too much coating is applied then the process is uneconomical and inefficient because the coating may take too long to dry, and if too little coating is applied then the ink jet recording sheet will not exhibit the desired characteristics of vivid image color, ink absorbency, high density of printing, etc. It is well settled that determination of optimum values of cause effective variables such as these process parameters is within the skill of one practicing in the art. *In re Boesch*, 205 USPQ 215 (CCPA 1980).

As to claim 37, Saito et al. teaches using paper having a basis weight in the range of 30.7-123 lb/3000 ft² as mentioned above, which range is inclusive of the range claimed in claim 37. Additionally, Saito et al. teaches that the raw paper can be subjected to calendar treatment to provide enhanced smoothness at col. 10, lines 20-23. Supercalendaring is a method well known in the art to provide very smooth and glossy finishes. It would have been obvious for one having ordinary skill in the art to have used a supercalendared paper having the claimed weight in the process of Saito et al. because Saito et al. teaches papers having the claimed weight and

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calendaring operations, and because the level of smoothness desired would be determined by a skilled artisan depending on the desired end use of the product.

As to claim 38, Saito et al. teaches that the base sheet is preferably formed of a chemical pulp, sizing agent, and a paper strengthening agent (col. 10, lines 1-12).

As to claim 41, Saito et al. teaches that a cationic mordant polymer is included in the coating composition in Example 1 (col. 12) which meets Applicant's limitation of an ink setting agent.

18. Claims 33, 35-38, and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito et al. (US 6,217,166).

Saito et al. discloses use of a dimensionally stable absorbent paper substrate in Example 1, which is then overcoated with polyethylene layers, thus forming a non-absorbent support. Saito et al. then teaches a method of applying an ink absorbing layer to the coated substrate comprising the steps of: providing coating composition makedown water; adding boric acid and polyvinyl alcohol (PVOH) to the water thus forming a coating composition; heating the composition to 40°C; and applying a coating of the composition onto the substrate (see Example 1 in column 12). While there is an additional step of applying polyethylene layers on the absorbent paper substrate in Saito et al., the method of Saito et al. none-the-less reads on Applicant's claimed limitations of "providing a dimensionally stable absorbent paper substrate" and "applying a coating of the composition onto the substrate and forming on the substrate a three-dimensional porous screen or sieve comprised of said reaction product." Because claim 33 includes broad "comprising" language, the claim does not exclude the presence of additional

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steps such as Saito et al.'s step of applying polyethylene layers onto the absorbent paper substrate prior to applying the coating composition. The transitional term "comprising," which is synonymous with "including," "containing," or "characterized by," is inclusive or open-ended and does not exclude additional, unrecited elements or method steps. *Moleculon Research Corp. v. CBS, Inc.*, 793 F.2d 1261, 229 USPQ 805 (Fed. Cir. 1986); *In re Baxter*, 656 F.2d 679, 686, 210 USPQ 795, 803 (CCPA 1981); *Ex parte Davis*, 80 USPQ 448, 450 (Bd. App. 948) ("comprising" leaves "the claim open for the inclusion of unspecified ingredients even in major amounts").

As discussed above, Saito et al. lacks a teaching that PVOH-boric acid-PVOH bonds are formed when the boric acid and PVOH are reacted together. Saito et al. also lacks a teaching of preheating the makedown water, the claimed order of the addition of boric acid and PVOH to the preheated makedown water, mixing, and that the coating forms a three-dimensional porous screen or sieve. It is the Examiner's position that PVOH-boric acid-PVOH bonds and a porous screen or sieve would inherently be formed in Saito et al.'s coated product for the reasons discussed above in section 17 with respect to Saito et al.'s ink absorbing layer. Also, it would have been obvious for one having ordinary skill in the art to have preheated the makedown water instead of heating after the composition is made, switching the order of addition of boric acid and PVOH, and to have performed mixing until dissolution for the reasons discussed above in section 17 with respect to Saito et al.'s ink absorbing layer.

Claims 35-38 are similarly rejected for the same reasons discussed above in section 17 with respect to the Saito et al. reference.

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19. Claims 39-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito et al. (US 6,217,166) as applied to claims 33, 35-38, 41, and 50 above, and further in view of Abe et al. (US 5,372,884).

As to claims 39 and 40, Saito et al. is applied for the reasons discussed above with respect to claim 33. Saito et al. discloses that the raw paper may comprise hardwood chemical pulp (LBKP or LUKP), softwood chemical pulp (NUKP or NBKP), fibers, sizing agent, strengthening agent, and a softening agent such as quaternary ammonium salt which is a cationic agent (col. 9, line 59 to col. 10, line 12). Saito et al. lacks a teaching of using rosin sizing agent as the sizing agent. Abe et al. is cited for its teaching of exemplary sizing agents that may be used in forming a base sheet to be used in a method of making an ink jet recording sheet. Abe et al. teaches that exemplary sizing agents include fatty acids, alkyl ketene dimer emulsions or rosin derivatives. It would have been obvious for one having ordinary skill in the art to have substituted rosin sizing agent for the sizing agent in the process of Saito et al. with the expectation of similar and successful results since rosin sizing agent is a known equivalent sizing agent to fatty acids and alkyl ketene dimers which are taught by Saito et al.

Saito et al. also does not disclose the specific amounts claimed, however it is unclear whether the amounts indicated are by weight or by volume as discussed in the 35 USC 112, 2nd paragraph rejection above. Additionally, it is the Examiner's position that a skilled artisan in the field of paper making would have been motivated to determine the optimum amounts of each component (hardwood versus softwood, the amount of sizing and strengthening agent, etc.) depending upon the desired characteristics and end use of the product.

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20. Claims 34 and 42-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito et al. (US 6,217,166) as applied to claims 33, 35-38, 41, and 50 above, and further in view of Bauer et al. (US 6,419,987).

Saito et al. is applied for the reasons discussed above with respect to claims 33 and 50 presented in section 17. Saito et al. lacks a teaching of an absorbent substrate used in combination with a coating composition comprising polyvinyl alcohol and boric acid as claimed in claim 42. It is the Examiner's position that it would have been obvious for one having ordinary skill in the art to have used an absorbent substrate as taught in the Background of Saito et al. in combination with the ink absorbing layer of Saito et al.'s invention for the reasons discussed above in section 17.

With respect to claims 34, 42, and 45, Saito et al. lacks a teaching of adding an immobilizer to its coating composition. It is noted that Saito et al. teaches that its coating composition may further comprise a variety of adjuvants known in the art (col. 9, lines 1-11), including, among other additives, a thickening agent. One skilled in the art would have been motivated to look to the prior art for specific adjuvants that may be used in its composition. Bauer et al. is cited for its teaching of thickening agents that may be used to thicken/crosslink polyvinyl alcohol besides borax (col. 4, lines 8-27). Included in Bauer et al.'s list of thickeners/crosslinkers is glyoxal. It would have been obvious for one having ordinary skill in the art, upon seeing the reference of Bauer et al., to have used one of the thickening agents/immobilizers taught by Bauer et al., including glyoxal, in the coating composition of Saito et al. with the expectation of successful results because Saito et al. generally teaches that a

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thickening agent may be included in the coating composition and because Bauer et al. teaches that glyoxal acts as a thickening agent/immobilizer for a polyvinyl alcohol material.

As to claim 43, Saito et al. teaches use of a cationic mordant polymer ink setting agent in its coating composition in Example 1 (col. 12).

As to claims 44 and 46, Saito et al. does not disclose the specific parts by weight of polyvinyl alcohol and boric acid (on a dry basis) that are set forth in claim 44. However, it is noted that in Example 1 on column 12, in the case where the amount of boric acid added is 30 ml (see Table 3, experiment #6), the percentages by weight of water, polyvinyl alcohol, and boric acid are 71%, 1.4%, and 19% respectively. While the water and boric acid percentages do not fall within the ranges in claim 46, it is the Examiner's position that 71% is close to "about 75%" and 1.4% is close to "about 1.0%." Additionally, it is noted that these points fall within the ranges of water, polyvinyl alcohol, and boric acid disclosed in the specification (last paragraph on page 12 of the specification). Finally, it is noted that Example 1 of Saito et al. is merely exemplary and is not limiting. It is the Examiner's position that one having ordinary skill in the art would have determined the optimum amounts of water, polyvinyl alcohol, and boric acid (both on a dry basis and wet basis) within the ratios of the components set forth in Saito et al.'s invention depending on the ink numbers and colors, i.e., depending on the desired characteristics of the end product.

Claim 47 is rejected for the same reasons discussed with respect to claim 35 above in section 17.

Claim 48 is rejected for the same reasons discussed with respect to claim 36 above in section 17.

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As to claim 49, it is the Examiner's position that it would have been obvious to have performed the process of Saito et al. on uncoated paper for the reasons discussed above with respect to claim 35 in section 17.

21. Claims 34 and 42-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito et al. (US 6,217,166) as applied to claims 33, 35-38, and 41 above, and further in view of Bauer et al. (US 6,419,987).

With respect to claim 42, Saito et al. is applied for the same reasons discussed above in section 18. Saito et al. discloses use of a dimensionally stable absorbent paper substrate in Example 1, which is then overcoated with polyethylene layers, thus forming a non-absorbent support. Saito et al. then teaches a method of applying an ink absorbing layer to the coated substrate comprising the steps of: providing coating composition makedown water; adding boric acid and polyvinyl alcohol (PVOH) to the water thus forming a coating composition; heating the composition to 40°C; and applying a coating of the composition onto the substrate (see Example 1 in column 12). While there is an additional step of applying polyethylene layers on the absorbent paper substrate in Saito et al., the method of Saito et al. none-the-less reads on Applicant's claimed limitations of "providing a dimensionally stable absorbent paper substrate" and "applying a coating of the composition onto the substrate." Because claim 42 includes broad "comprising" language, the claim does not exclude the presence of additional steps such as Saito et al.'s step of applying polyethylene layers onto the absorbent paper substrate prior to applying the coating composition. The transitional term "comprising," which is synonymous with "including," "containing," or "characterized by," is inclusive or open-ended and does not

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exclude additional, unrecited elements or method steps. *Moleculon Research Corp. v. CBS, Inc.*, 793 F.2d 1261, 229 USPQ 805 (Fed. Cir. 1986); *In re Baxter*, 656 F.2d 679, 686, 210 USPQ 795, 803 (CCPA 1981); *Ex parte Davis*, 80 USPQ 448, 450 (Bd. App. 948) (“comprising” leaves “the claim open for the inclusion of unspecified ingredients even in major amounts”).

As discussed above, Saito et al. lacks a teaching that PVOH-boric acid-PVOH bonds are formed when the boric acid and PVOH are reacted together. Saito et al. also lacks a teaching of preheating the makedown water, the claimed order of the addition of boric acid and PVOH to the preheated makedown water, and mixing until dissolution. It is the Examiner’s position that PVOH-boric acid-PVOH bonds would inherently be formed in Saito et al.’s coated product for the reasons discussed above in section 17 with respect to Saito et al.’s ink absorbing layer. Also, it would have been obvious for one having ordinary skill in the art to have preheated the makedown water instead of heating after the composition is made, switching the order of addition of boric acid and PVOH, and to have performed mixing until dissolution for the reasons discussed above in section 17 with respect to Saito et al.’s ink absorbing layer.

With respect to claims 34, 42, and 45, Saito et al. lacks a teaching of adding an immobilizer to its coating composition. The Bauer et al. reference is applied to teach this element for the same reasons discussed in section 20 above. Claims 43, 44, and 46-49 are applied for the same reasons discussed in section 20 above.

Conclusion

22. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kasahara et al. (US 6,165,606) is cited for its teaching of using a coating

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composition comprising both PVOH and boric acid and is heated to 40°C before coating, similar to Saito et al. (Example 1, col. 17-18). Schliesman et al. (US 6,129,785) is cited for its teaching of cooking PVOH in makedown water as a first step in preparing its coating composition; Schliesman et al. lacks a teaching of including boric acid in the coating. Riou et al. (US 4,877,686) and Saito et al. (US 6,037,050) are cited for their teachings of a ink jet recording sheet comprising a coating containing both PVOH and borax, however the references do not teaching heating the coating compositions. Tokunaga et al. (US 6,403,162) is cited for its teaching of a coating composition that comprises both PVOH and boric acid and is applied at a temperature of 36°C (Example 2).

23. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kirsten Crockford Jolley whose telephone number is 703-306-5461. The examiner can normally be reached on Monday to Thursday and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive Beck can be reached on 703-308-2333. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1193.

kcj
June 2, 2003

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